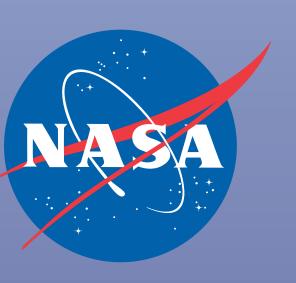
The Architecture and Utility of SeaBASS: the SeaWiFS Bio-optical Archive and Storage System

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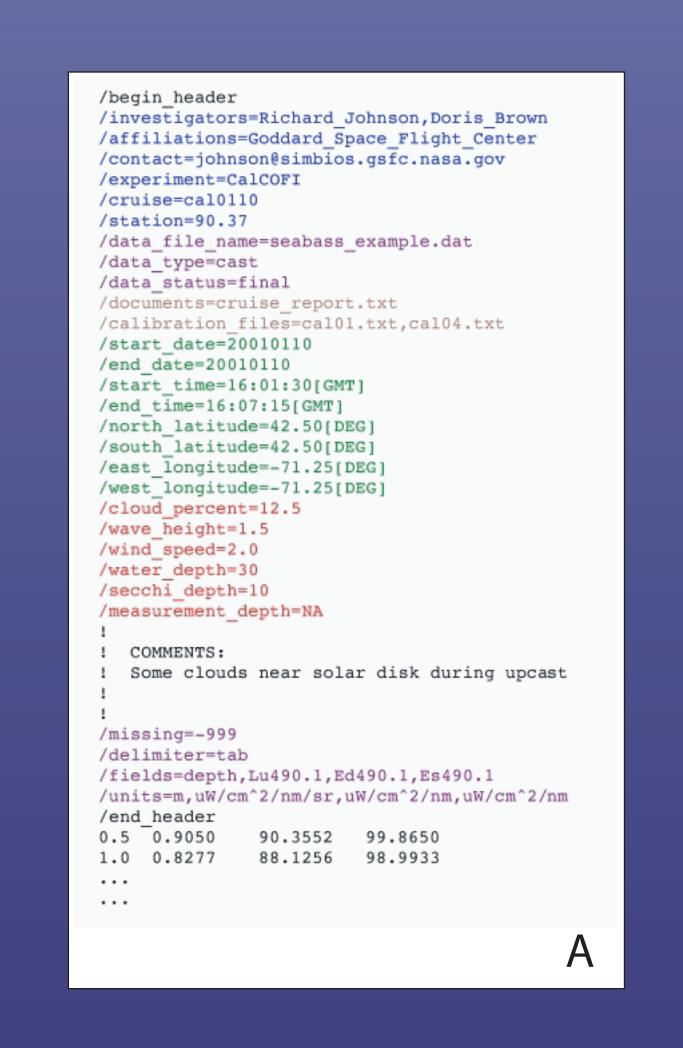
³ Science Applications International Corp., Greenbelt, Maryland, USA

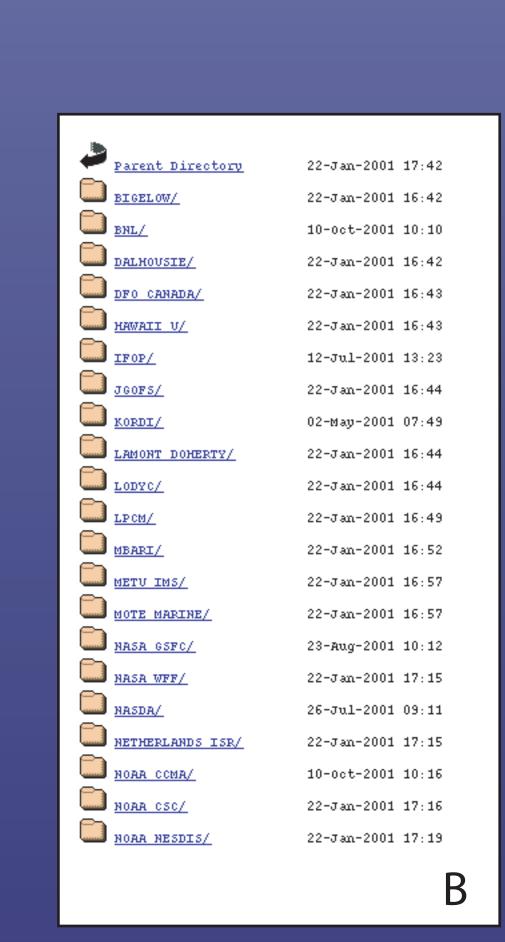
⁴ NASA Goddard Space Flight Center, Greenbelt, Maryland, USA

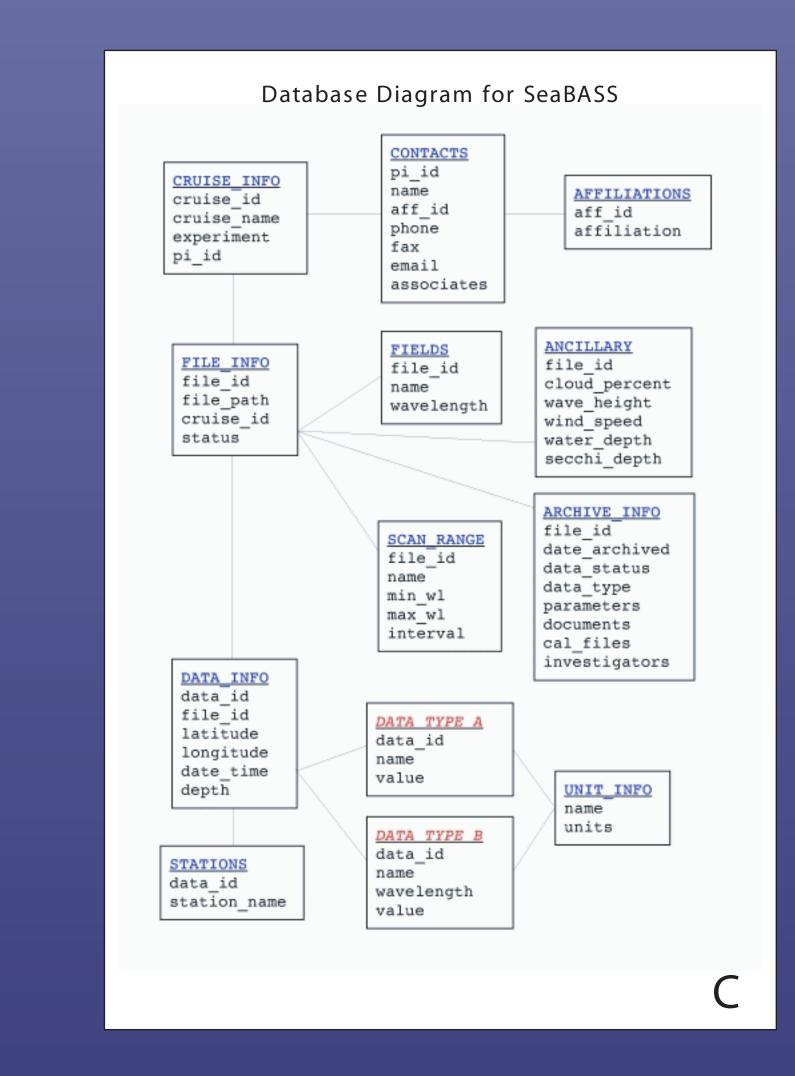


http://seabass.gsfc.nasa.gov

ARCHITECTURE

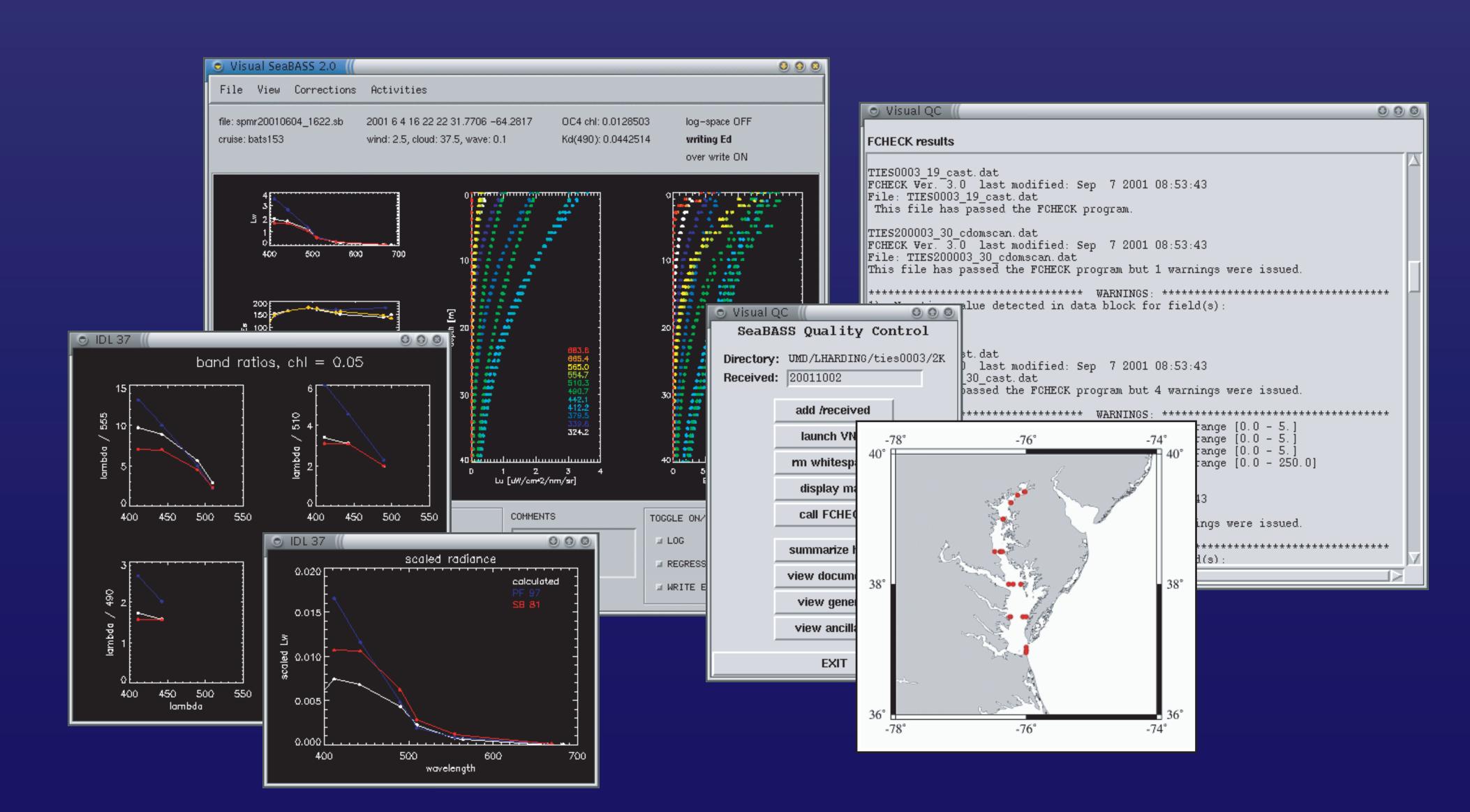






(A) Valid SeaBASS data files are ASCII text with data values presented in columns. Each file includes predefined metadata headers which refer to the contributor and experiment (indicated by blue text), related documentation and calibration files (brown), date and location (green), ancillary conditions (red), and the structure and content of the data file (purple). (B) All data files and related documents are stored in a directory tree, organized by contributor affiliation and experiment. (C) Data are further archived using a relational database management system. Metadata are loaded into a series of database tables (indicated by blue text). Geophysical data values are loaded into an additional series of tables (red) defined by data type (for example, pigment or sun photometer data).

QUALITY CONTROL



Examples of software used to verify SeaBASS data file format and evaluate and analyze radiometric depth profiles are shown. The principle component of the format-verification software is known as FCHECK. Contributors may test a data file for compatibility with the SeaBASS format by electronically mailing the file to fcheck@seabass.gsfc.nasa.gov. Additional quality control methods include generation of regional maps and comparison of field data with theoretical and modeled values.

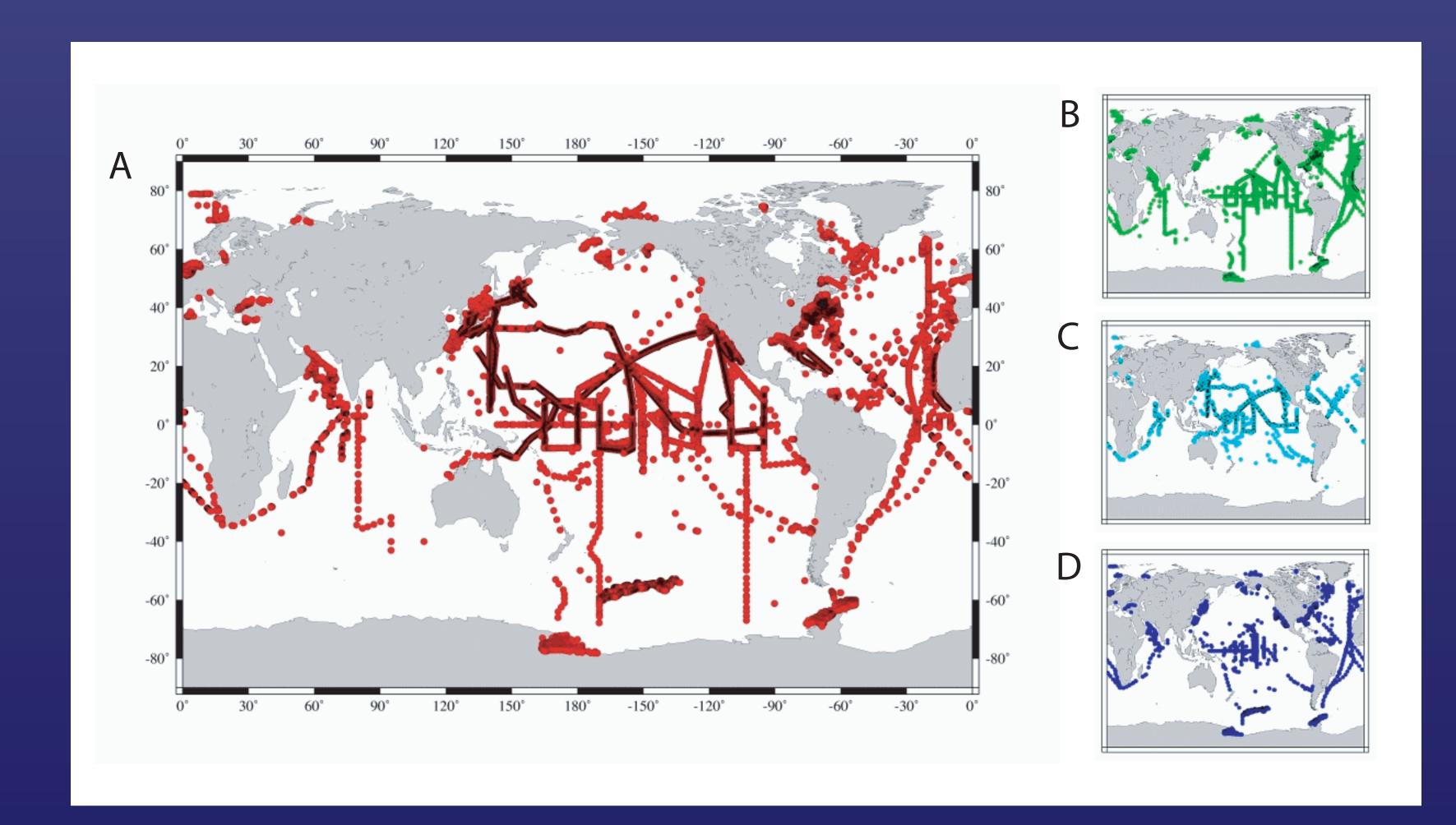
PHILOSOPHY AND ACCESS

The National Aeronautics and Space Administration's (NASA) Sea-viewing Wide Field-of-view Sensor (SeaWiFS) Project designed the SeaWiFS Bio-optical Archive and Storage System (SeaBASS) to be a local repository for in situ radiometric and pigment data regularly used in scientific analyses, such as satellite data product validation and bio-optical algorithm development. The system has since been expanded to contain data sets collected by participants of NASA's Sensor Intercomparison and Merger for Biological and Interdisciplinary Oceanic Studies (SIMBIOS) Project. The SIMBIOS Project uses these data in support of international protocol workshops, data merger studies, and time series analyses.

Archived data include measurements of apparent and inherent optical properties, phytoplankton pigment concentrations, and other related oceanographic and atmospheric data. Data are collected using a number of instrument packages (such as profilers and handheld instruments) on a variety of platforms (including ships and moorings).

To protect the publication rights of contributors' data, full access to SeaBASS is limited to members of the SIMBIOS Science Team and other NASA-funded researchers. Data collected prior to 31 December 1999, however, are available to the public and have been released to the National Oceanic and Atmospheric Administration's (NOAA) National Oceanographic Data Center. The Project will release additional data every three years at the conclusion of each SIMBIOS NASA Research Announcement.

DATA DISTRIBUTION



The global distribution of (A) all data archived in SeaBASS, (B) chlorophyll a concentrations, (C) aerosol optical thicknesses, and (D) profiles of apparent optical properties, as of October 2001.

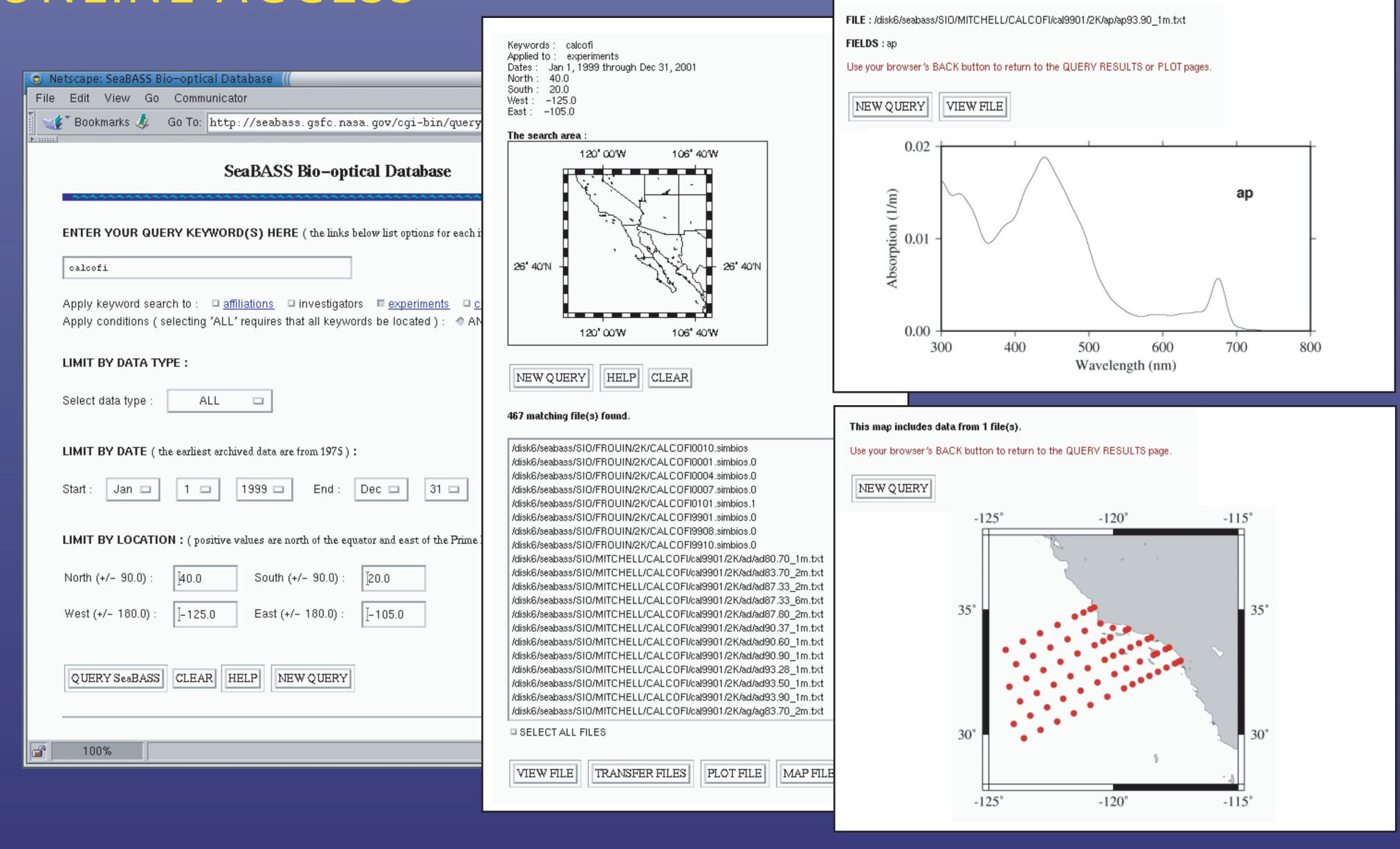
ADDITIONAL READING

Werdell, P.J., S. Bailey, and G.S. Fargion, 2000: "SeaBASS data protocols and policy." In: G.S. Fargion and J.L. Mueller, Ocean Optics Protocols for Satellite Ocean Color Sensor Validation, Revision 2, NASA Tech. Memo. 2000-209966, NASA Goddard Space Flight Center, Greenbelt, Maryland, 170-172.

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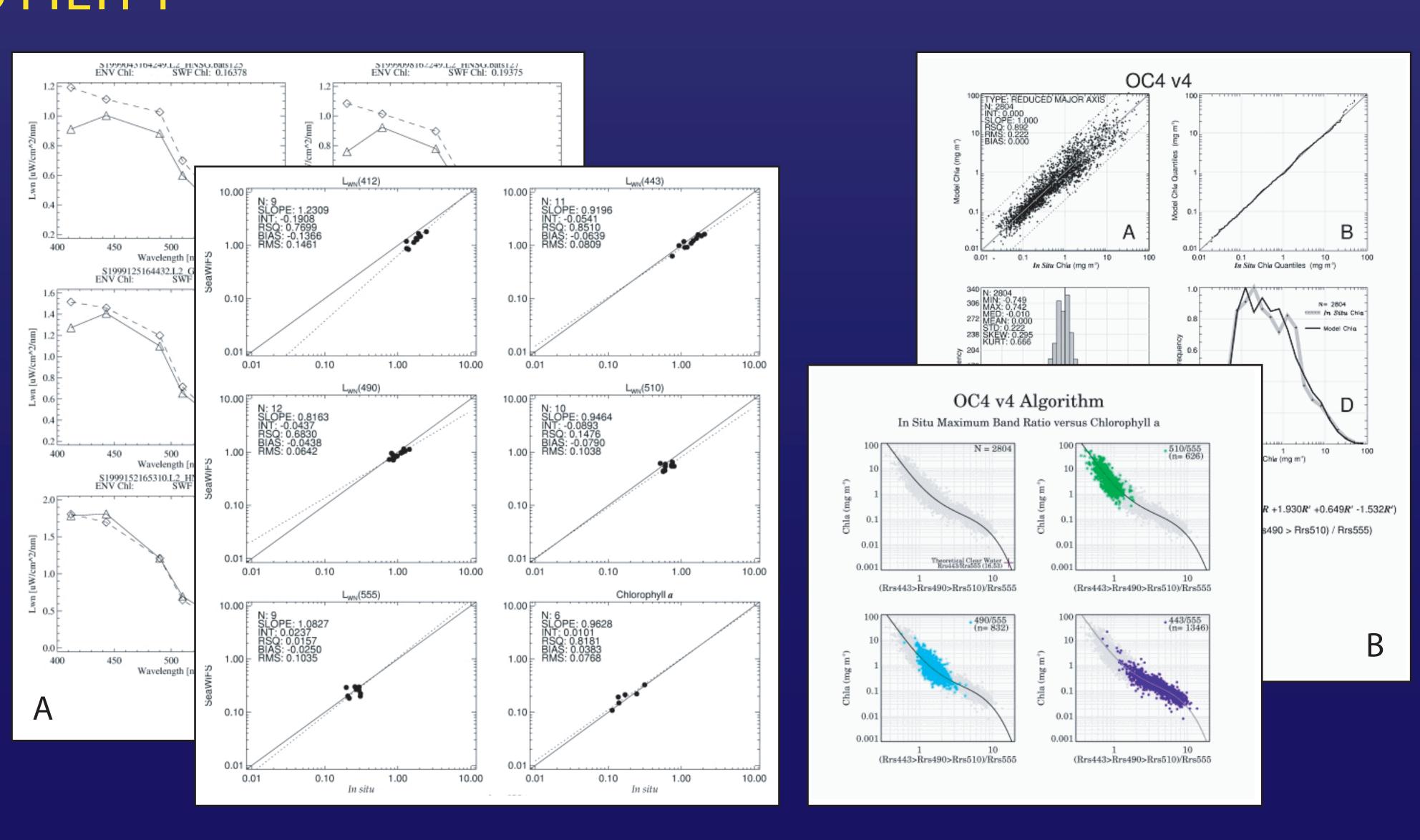
* O'Reilly, J.E., S. Maritorena, D.A. Siegel, M.C. O'Brien, D. Toole, B.G. Mitchell, M. Kahru, F.P. Chavez, P. Strutton, G.F. Cota, S.B. Hooker, C.R. McClain, K.L. Carder, F. Muller-Karger, L. Harding, A. Magnuson, D. Phinney, G.F. Moore, J. Aiken, K.R. Arrigo, R. Letelier, and M. Culver, 2000: "Ocean color chlorophyll a algorithms for SeaWiFS, OC2, and OC4: Version 4." In: J.E. O'Reilly and co-authors, SeaWiFS Postlaunch Calibration and Validation Analyses, Part 3. NASA Tech. Memo. 2000-206892, Vol. 11, S.B. Hooker and E.R. Firestone, Eds., NASA Goddard Space Flight Center, Greenbelt, Maryland, 9-23.

ONLINE ACCESS



The full bio-optical data set is available via the World Wide Web. Data may be located and retrieved using a series of online search engines. In this example, a query returns a list of matching data files, which are available to view, download, map, or plot. Other search engines provide direct access to geophysical data values, such as phytoplankton pigment concentrations and aerosol optical thicknesses.

UTILITY



Example analyses and results from (A) SeaWiFS data product validation, specifically satellite-to-in situ match-up comparisons; and (B) ocean color chlorophyll a algorithm development*. The plots in (B) are courtesy of John E. O'Reilly, NOAA.